ART. XX.—*Diseases of the Heart and Thoracic Aorta.* By BYROM BRAMWELL, M.D., F.R.C.P.E.; Lecturer on the Principles and Practice of Medicine, and on Practical Medicine and Medical Diagnosis in the Extra-Academical School of Medicine, Edinburgh; Pathologist to the Edinburgh Royal Infirmary, etc., etc. 8vo., pp. 782, with 317 illustrations. New York: D. Appleton & Co., 1884.

DR. BRAMWELL, occupied during recent years in teaching in the Extra-Mural School of Medicine in Edinburgh, and as Pathologist to the Royal Infirmary, formerly enjoyed at Newcastle-on-Tyne the advantages of the double position of physician and pathologist to the infirmary. The good results of a training which has enabled him to acquire large experience at first hand and at the same time, both in pathological anatomy and in clinical pathology, were apparent in his excellent work on Diseases of the Spinal Cord, issued two years ago, and well received in his own and in this country as a text-book.

The results of such a training are still more plainly seen in the present treatise. It is the book of a teacher for students—not only for beginners, but also for students of older growth and large experience. Here we may say, that not being subject to the science-primer and quiz-compend levity, we hold that even beginners in the study of medicine will save money, energy, and time by buying and studying the best books which treat fully and connectedly of their subjects; that the difficulty about the short-cuts to knowledge is that they are usually no thoroughfare, and that those advising their use are apt to prove false guides. For he who would arrive satisfactorily at the goal must follow the arduous path which has been laid out by honest workers at great labor and expense.

The habits of the class-room are shown in the ordering of the topics and in the almost chart-like arrangement of the various divisions, sub-divisions, and headings. This elaborately methodical arrangement leads to repetitions and is inconvenient in continuous reading, but it greatly facilitates the study of the subject and reference to particular divisions of it. We learn from the preface that the subject matter of the work was delivered almost exactly as it stands in the form of lectures to the author's class at the beginning of the winter sessions of 1883-84. It is, however, the result of a long period of preparation, for we are told that during the past fifteen years the author has been constantly thinking and talking about the subject, and steadily accumulating the clinical knowledge and pathological material necessary for the production of such a work.

Dr. Bramwell evidently places a high estimate upon the value of illustrations. Of the 317 which have place in this volume many are full-page lithographs of naked-eye and microscopical subjects. All these lithographs and more than half of the whole number of illustrations are original.

The introductory anatomical and physiological remarks occupy forty-five pages, and fully represent the knowledge of the subject in its present state. At the outset the author emphasizes the fact, too often overlooked, that the heart is not merely a mechanical but that it is also a muscular pump, and that its action presents problems that are partly mechanical and partly vital. He has drawn largely upon Dr. Gaskell's brilliant researches relating to the heart-muscle and its automatic mechanism and the general subject of cardiac innervation, and has not overlooked the recent contributions to the physiology of the heart by Martin, Sedgwick, Sewall, Donaldson, and other workers in the biological laboratory of the Johns Hopkins University. At this point we observe a defect in the book, which repeatedly occurs and is likely to be a cause of some annoyance to the close student. It is the omission of bibliographical references. In view of the fact that the "Studies" from the biological laboratory of the Johns Hopkins University and the *Journal of Physiology* are neither commonly read nor easy of access to a great number of the readers of Dr. Bramwell's book, the following passage, which, without reference or further explanation, comprises all that is said under the heading of "The Arterial Blood Supply of the Heart," may be taken as a fair example to illustrate this fault of omission:—

> "As we all know, arterial blood is conveyed to the cardiac muscle by the coronary arteries, and until quite recently it was supposed by many of our leading physiologists and physicians that in consequence of the relative position of the parts, the orifices of the coronary arteries must of necessity be closed during the systole of the ventricle, the valve flaps being pressed against the orifices of the coronary arteries by the blood stream in its passage from the ventricle into the aorta.
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> "The recent experiments, however, of Martin and Sedgwick seem conclusively to show that this supposed closure does not occur, and that the coronary, like all the other arteries of the body, are distended during the systole of the heart.
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> "These observers have shown, by means of careful cardiographic tracings, that the blood waves in the coronary arteries and carotids are exactly synchronous both in normal and diseased states of the circulation.
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> "It seems certain, therefore, as Dr. George Balfour and others have previously argued, that the blood is propelled into the coronary arteries during the systole of the heart."

Many readers to whom this view is altogether new would be glad to avail themselves of a reference to what may be termed the *bottom facts.*

Chapter II. is devoted to the general pathology of the heart.

The accepted doctrines are stated in a clear, terse, and practical manner.

In the third chapter we find a well-arranged and suggestive method of case-taking set forth, together with a summary of symptoms and the methods and results of the physical examination in cases of heart disease.

Much space is devoted to the discussion of Cheyne-Stokes' respiration, and the theories that have been advanced by Traube, Sansom, and Filehne to explain the manner in which it is produced. This peculiar rhythmical dyspnœa is, as is well known, an ominous symptom, occurring usually, but by no means exclusively, in advanced cases of heart disease, especially of dilated and fatty right heart, atheroma of the coronary arteries, and aortic dilatation, and being in most cases followed shortly by death. It is probably to be accounted for by the fact that periodical variations occur in the amount of oxygen supplied to the respiratory centre in the medulla. The author's discussion of this subject is exceedingly ingenious and interesting. "The respiratory centre in the medulla oblongata probably consists of two parts—one connected with inspiration (the inspiratory centre), the other with expiration (the expiratory centre)." It is, therefore, "the seat of two conflicting forces, one tending to generate inspiratory impulses (the discharging portion), and the other offering resistance to the generation of these impulses (the restraining or inhibiting portion); the one and the other alternately gaining the victory, and thus leading to a rhythmical discharge." These two parts are differently acted upon by the same stimulus, venous blood exciting the action of the discharging portion and depressing the action of the restraining portion; arterial blood, on the contrary, depressing the action of the discharging portion and intensifying that of the restraining part. Moreover both these parts of the centre are supposed to be in a state of irritable weakness. Starting then at the end of a period of apnœa, we may suppose that the venous blood gradually excites a paroxysm of dyspnœa, (1) by acting directly upon the inspiratory centre itself, depressing the action of the restraining portion and arousing the action of the discharging portion, (2) by stimulating the action of the vaso-motor centre, in consequence of which the arterioles are contracted and the supply of oxygen to the respiratory centre is still further diminished. The excessive irritability of the discharging portion of the respiratory centre tends to excessive discharges by which a condition of dyspnœa is produced. But in consequence of its irritative weakness, it speedily becomes exhausted and the dyspnœa tends to subside. The excessive respiratory efforts during the paroxysm of dyspnœa causes the blood, previously venous, to become arterialized; stimulation of the discharging portions of the respiratory centre ceases; stimulation of the restraining portion is produced; and in consequence of the deficient stimulation and over-exhaustion of the discharging portion, the restraining portion has full swing, and the condition of apnœa is produced. The changes supposed to take place during a paroxysm and pause of Cheyne-Stokes' respiration are illustrated by six diagrams.

Several pages are used—we were about to say wasted—in descriptions of the mechanism of the various forms of the sphygmograph. The author gives preference to Mahomed's modification of Marey's instrument, and to the convenient and portable little instrument of Dudgeon. We confess that the latter has been a disappointment to us. The tracings of Pond's instrument, the mechanism of which has, with modifications, been adopted by Dudgeon, are much more satisfactory, although the instrument is certainly less portable and more delicate. The tracings of the different instruments now in use are so different in certain essential particulars, as the relative length of the up-stroke and the down-stroke, that we believe it would be a good rule in the publication of cases illustrated by sphygmograms to designate the instrument used.

The author holds that the three conditions necessary for perceptible reduplication of the first sound are considerable asynchronism in the contraction of the two ventricles, diminished duration of one or other, or both of the component parts of the reduplicated sound and slow action of the heart.

He also holds the generally accepted view that reduplication of the second sound is due to asynchronous closure and tension of the aortic and pulmonary valve-flaps, and discusses at length the various conditions by which such asynchronous action of the ventricles may be brought about. Other theories, those of Sansom, George Balfour, and Guttmann are also given in brief.

Dr. Bramwell's method of treating the much vexed and unsettled subject of functional murmurs partakes more of the nature of a critical review of the various opinions than of dogmatic or *ex cathedra* assertion. He concludes, however, that the *sudden* propulsion of a *large* blood-wave of *abnormal* (spanæmia) composition into the pulmonary artery, which is probably in many cases dilated, is an efficient cause for the production of the basic murmur which is heard in the second left interspace in the earlier stages of anæmia. The italics here are the author's, and they illustrate one of his methods of accentuating his utterances. This chapter concludes with brief observations on the examination of the venous system.

With chapter IV. the study of the individual diseases begins. They are considered in 5 groups, as follows :—

(1) The diseases of the pericardium.

(2) The diseases of the endocardium.

(3) The diseases of the myocardium.

(4) Neurotic affections, which include the purely functional diseases of the organ.

(5) The diseases of the great bloodvessels.

The congenital malformations of the heart are described, contrary to the usual arrangement, in their proper place under diseases of the endocardium and myocardium.

The section on pericarditis is well given. The morbid anatomy is illustrated by no less than eighteen figures, some of which seem to us, however, neither clear nor necessary. The differential diagnosis is fully considered, and for the most part by means of tables of parallel columns. The treatment is up to date and ably taught. We notice upon page 338 the familiar name of a distinguished American physician incorrectly spelt. Aspiration of the effusion is advised when the action of the heart is seriously embarrassed by its amount or the rapidity of its accumulation, and life thereby endangered. In the directions for the operation the rules laid down by Dr. John B. Roberts, of Philadelphia, are followed. In case of a purulent effusion the sac is to be laid open with strict antiseptic precautions and a drainage tube inserted, the same indications for treatment being observed as in other internal abscesses.

Chapter V. treats of endocarditis and the resulting valvular lesions. This is certainly one of the strongest chapters in a strong book, and will take rank as in many respects the best article upon this group of lesions in any text-book. It is illustrated by no less than sixty-six figures, and takes up 200 pages of the volume. Acute endocarditis is considered first in its "simple" form, later in its "ulcerative" form. Especial attention is directed to the familiar influence of absolute rest in those affections liable to endocarditis as a complication as tending to avert that complication and its serious results.

Sibson's observations on the importance of rest in those affections are quoted at length. The question of the treatment of acute rheumatism by salicin and the salicylates is fully discussed, and the administration of full doses of pure salicin in acute rheumatic endocarditis, after the manner recommended by Dr. Maclagan, is strongly advised. To use the author's words :—

> "I cannot help thinking that if this treatment were rigorously carried out in the earlier stages of the attack, the frequency of endocarditis and other cardiac complications would be materially diminished."

The mixed alkaline and salicin treatment is dismissed with mere mention.

Ulcerative endocarditis is not regarded as a specific infectious disease in the same sense that typhoid, scarlet fever, and smallpox are. Inoculation experiments have failed to reproduce the disease. The clinical history is fully given and the *cardiac*, *typhoid*, *pyæmic*, and *ague-like* types are described—a clinical subdivision that appears to us of questionable utility, and as likely to lead *into* as *out of* confusion. The affection is always fatal, and the subject of treatment is summed up in a few discouraging words.

Mitral regurgitation is due to muscular and relative incompetence on the one hand, and to organic changes in the valve segments on the other. The former is amenable to treatment, and can often be completely cured. The latter is incurable; treatment can only control and modify the secondary conditions and tend to establish and maintain compensation. The treatment appropriate to each condition is separately and clearly set forth. The author regards arsenic as a cardiac tonic of much value, which is too little used in the treatment of mitral regurgitation. He looks upon digitalis properly used as *the* remedy. As regards the treatment of mitral stenosis :—

> "The indications are the same, and the methods of treatment are similar to those which have been described as suitable in cases of mitral regurgitation. I need not again enter into details, but must once more emphasize the statement, that in the earlier stages, and so long as compensation is perfect, little or no drug treatment is required."

In aortic incompetence the same wise general rule of "little or no drug treatment previous to failure of compensation," is laid down. When the left ventricle begins to fail and dilatation to replace hypertrophy, cardiac tonics and stimulants are to be cautiously given. Here arsenic has seemed in the early stages of the trouble the most useful drug both as a tonic and as relieving the heart pain, which is a common attendant of aortic incompetence. Digitalis when needed should be given in small doses, and intermitted as soon as its tonic effects are realized. The rules for the management of aortic stenosis are the same.

Chapter VI. on diseases of the myocardium, includes acute myocarditis, chronic myocarditis or fibroid degeneration, partial aneurism of the heart, hypertrophy and dilatation of the walls of the several chambers of the heart, atrophy, fatty infiltration, fatty degeneration, spontaneous rupture and tumors of the heart.

This group of subjects is ably treated, but without as far as we discover any extension of the field of knowledge. The pathological views closely correspond to those so ably presented by Dr. W. H. Welch, at the last meeting of the American Medical Association. The symptomatology remains obscure. No reference is made to the efforts of Rigal and Jubel-Renoy, in France, and L. M. Petrone, in Italy, to clear up this part of the subject and establish definite rules for the diagnosis of myocarditis.

Free use is made of Wickham Legg's admirable Bradshaw Lecture on Cardiac Aneurism (1883), a review of which appeared in the last number of this Journal, and the treatment of this subject is both more extended and more satisfactory than in most text-books on the heart.

"Idiopathic" hypertrophy of the heart scarcely receives the attention or space that it demands. We are told that its occurrence is doubted by some observers. The author holds the opinion drawn from the "clinical examination of living patients," that such cases do actually occur. The condition, is, however, rarely seen on the *post-mortem* table, as it seldom causes death. The part played in the causation of so-called idiopathic cardiac hypertrophy by alcohol, and in particular by excessive potations of beer, as determined by Bollinger, and Schmidbauer, in Munich, does not appear to have attracted the author's attention. These observers attribute the great frequency of hypertrophy of the heart without valvular lesions or affection of the kidney, which occurs in Munich, to the excessive habitual consumption of beer in that city. Hypertrophy is favored by the direct action of the alcohol upon the heart, by the enormous amount of fluid introduced into the body, and by the readily assimilated nutritive constituents of the beer itself. Furthermore, such habits are commonly associated with great bodily activity. The subjects of this form of hypertrophy, mostly men, and often of middle age, are always plethoric. The characteristic changes consist in the participation of both sides of the heart in the overgrowth, and in the enormous increase in the volume of the primitive muscular elements, with enlargement of the nuclei. Bollinger found in most of his cases no anatomical evidences of inflammation, nor of fatty degeneration. Death takes place after brief illness, with symptoms of cardiac failure, and must be looked upon in the absence of adequate anatomical lesions as due to paralysis of the cardiac nerves and ganglia.

Chapter VIII. treats of the cardiac neuroses, including palpitation, intermittent action, and angina pectoris.

The group of symptoms included under the term angina pectoris, are, in all probability, produced by a number of different causes. But the essential feature of angina pectoris is pain in the region of the heart. The cardiac pain often met with in young persons, rarely associated with structural changes in the heart or vascular apparatus, and seldom, if ever, fatal, may be called functional angina pectoris (pseudo-angina). This affection is in strong contrast to true or organic angina pectoris, which rarely occurs before the fortieth year, is often associated with coarse structural changes, very generally with minute degenerative changes in the heart and vessels, is frequently fatal, in which the pain is intense and often accompanied by a terrible sensation of impending death.

> "This division into a serious and organic form, and a comparatively trivial and inorganic form, is of practical clinical utility, and may be safely adopted, provided that it is clearly understood that the two forms run one into the other, and that it is sometimes difficult or impossible to separate them at the bedside."

We observe nothing new in the treatment of angina pectoris, either during or between the attacks.

The concluding chapter is devoted to the consideration of the diseases of the thoracic aorta. Acute aortitis, atheroma and general dilatation, aneurism, and coarctation of the aortic arch are briefly discussed. The space given to aneurism appears to us meagre in comparison with the importance of the subject. This part of the book is very satisfactory. The remarks upon diagnosis are especially clear and full. In the management of thoracic aneurism the author enforces great moderation in food and drink, but does not regard the extremely restricted diet of Tufnell as necessary. Dr. Bramwell believes that the favorable influence of the potassium iodide is due chiefly to its action in reducing blood-pressure, and relieving tension within the sac, and partly by removing the endarteritis obliterans, which is often present, more especially in syphilitic cases, in the minute arteries which ramify in the walls of the sac, and supply it with nutrient fluid.

The administration of chloral hydrate in small doses (seven grains *ter die*) has seemed beneficial in some cases in which arterial tension has been distinctly increased. The method of treatment by galvano-puncture is explained at length.

The cardiograph is described in an appendix.

In conclusion, we commend this book as well arranged, clear, trustworthy, and up to date. J. C. W.